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EXAMINER

WAKS, JOSEPH

ART UNIT PAPER NUMBER

2834

DATE MAILED: 04/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

09/470,428

Applicant(s)

NEAL, GRIFFITH D.

Examiner

Joseph Waks

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 45 is/are allowed.
- 6) ☐ Claim(s) 1-7, 9-29, 32, 37-49 and 51-59 is/are rejected.
- 7) ☒ Claim(s) 30, 31, 34-36 and 50 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-7, 10-19, 21-29, 32, 33, 37-44, 46-49 and 55-59** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano (US 5,783,888)** in view of **Kuwert et al. (US 5,986,365)**, **Nakamura et al. (US 5,459,190)** and **Shioya et al. (US 5,942,824)**.

Yamano discloses in Figure 5 a spindle motor having a rotating shaft 3, a hub 54 attached to the shaft and including a magnet 5b, a lower bearing 2a and an upper bearing 2b surrounding the shaft, a stator 6 comprising conductors 6a, and a monolithically formed body 57 substantially encapsulating the stator conductors wherein the thermoplastic material is molded to form the body configured to align the shaft, the hub and the bearings, a mounting features formed in the body (Re the apertures accommodating screws 1b) to mount the motor to a device powered by the motor, wherein the body surrounds the bearings, a core 6b, conductors 6a. However, **Yamano** does not disclose the hub including the permanent magnet, the molded material being injection molded and the insert substantially encapsulated within the body.

Kuwert et al. disclose a spindle motor having a hub 3 including a permanent magnet 7 to drive a hard disc drive and a hub 3 comprising a disc support member (Re column 2, lines 25-30).

Nakamura et al. disclose an injection molded thermoplastic material 6 and having linear thermal expansion of $1.97 \times 10^{-5}/^{\circ}\text{C}$ or 1.09×10^{-5} in/in $^{\circ}\text{F}$ and thermal conductivity of 0.0040 to 0.0055 cal/s $^{\circ}\text{C}$ or 1.67 watts/m $^{\circ}\text{K}$ (Re column 5, Table 1) and encapsulating stator conductors 10 for the purpose of protecting the motor from adverse working conditions such as mechanical stresses due to a pulsating torque and heat generated during motor operation (Re column 1, lines 21-30) while avoiding long curing time or deterioration of the insulating properties of the material caused by de-bonding resulted by vibration or thermal cycles the material is exposed during operation (Re column 1, lines 31-67 and column 2, lines 1-25).

Shioya et al. disclose in Figure 7 a high speed spindle motor comprising a shaft 62 fixed relative to a monolithically formed body 126, 124 substantially encapsulating the stator and the insert 72, for the purpose of forming a hydrodynamic bearing structure and providing a back iron for a coreless stator structure, and a second, enhancement magnet 128 being a part of a magnetic bearing.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the motor as taught by **Yamano** and to provide the hub including the permanent magnet as taught by **Kuwert et al.** for the purpose of driving a hard disc drive while simplifying the system controls and minimizing the size of the motor.

It would have been further obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the injection molded thermoplastic material as taught by **Nakamura et al.** for the purpose of protecting the motor from adverse working conditions such as mechanical stresses due to a pulsating torque and heat generated during motor operation while avoiding long curing time or deterioration of the

insulating properties of the material caused by de-bonding resulted by vibration or thermal cycles the material is exposed during operation and to and dissipate the heat from the stator.

It would have been furthermore obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the insert as taught by **Shioya et al.** for the purpose of providing a back iron for a coreless stator structure.

It would have been furthermore obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the shaft being fixed relative to the body as taught by **Shioya et al.** for the purpose of forming a hydrodynamic bearing structure and providing a back iron for a coreless stator structure. It would have been further obvious to one having ordinary skill in the art at the time the invention was made to design the combined motor and to provide the second magnet encapsulated within the body as taught by **Shioya et al.** for the purpose of enhancing the alignment of the rotor during operation and to provide a non-friction thrust bearing.

Re claim 29, the high speed operation is inherent to the motor structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the motor to meet the specific speed required for the memory drive application like at least 10,000 rpm, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Re claim 33, the recited limitation of the body being machined is a method of forming the device that is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Re claim 42, the combined motor includes all elements essentially as claimed. However, it fails to disclose the thermoplastic material comprising polyphenyl sulfide.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the motor as taught by **Yamano** and to provide the thermoplastic material comprising polyphenyl sulfide for the purpose of providing electrically insulating material having good thermal conductivity, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Re claim 43, the recited limitation of the shaft being fixed to the body by molding with the stator in the thermoplastic body is a method of forming the device that is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Re claim 44, the recited limitation of the bearing being press fit to the body is a method of forming the device that is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

3. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano** (US 5,783,888) in view of **Kuwert et al.** (US 5,986,365), **Nakamura et al.** (US 5,459,190) and **Shioya et al.** (US 5,942,824) as applied to claim 1 above and further in view of **Kurosawa et al.** (US 6,043,583).

The combined spindle motor discloses all elements essentially as claimed. However, it fails to disclose the motor having the permanent magnet concentrically disposed around the stator.

Kurosawa et al. disclose in column 1, lines 10-35 that the structures of inner and outer rotors as commonly used in spindle motors serving disc drives

It would have been an obvious matter of design choice to design the combined motor and to provide the motor structure with an inner or outer rotor as taught by **Kurosawa et al.** for service as disc drive rotors for computer or since applicant has not disclosed that the inner or outer rotor structure solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with an inner, outer or an axial gap rotor stator configuration.

4. **Claims 20, 53, and 54** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano** (US 5,783,888) in view of **Nakamura et al.** (US 5,459,190).

Yamano discloses in Figure 5 a motor having a shaft 3, a bearing 2a or 2b surrounding the shaft, windings 6a, and a monolithically formed body 57 substantially encapsulating the stator conductors wherein the thermoplastic material is molded to form the body. However, **Yamano** does not disclose the body comprising the material including the aluminum oxide as a filler.

Nakamura et al. disclose in column 4, line 21 the injection molded thermoplastic material including alumina (or aluminum oxide) as a filler for the purpose of improving the thermal conductivity of the material.

It would have been an obvious matter of design choice to design the motor as disclosed by **Yamano** and to provide the injection molded thermoplastic material including aluminum oxide as a filler as taught by **Nakamura et al.** for the purpose of improving the thermal conductivity of the material.

5. **Claim 52** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamano (US 5,783,888)** in view of **Nakamura et al. (US 5,459,190)** as applied to claim 20 above and further in view of **Hatton (US 6,433,448)**.

The combined motor discloses all elements essentially as claimed. However, it does not disclose the body comprising the thermoplastic material including nylon.

Hatton discloses in Figure 5 a motor and the injection molded thermoplastic material 312 including nylon for the purpose of attaching the laminations 300 together without using mechanical fasteners.

It would have been an obvious matter of design choice to design the combined motor as and to provide the injection molded thermoplastic material including nylon as taught by **Hatton** for the purpose of attaching the laminations 300 together without using mechanical fasteners.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. **Claim 51** is rejected under the judicially created doctrine of double patenting over claim 32 of U. S. Patent No. 6,347,464 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: the thermoplastic material comprising polyphenyl sulfide.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Allowable Subject Matter

8. **Claims 30, 31, 34-36 and 50** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claims 30, 31, 34, and 35, the feature of the insert providing rigidity of the body or enhancing the heat transfer away from the bearing and the stator or enhancing dampening motor vibrations or audible noise, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

Re claim 36, the feature of the insert substantially encapsulated in the body and positioned between the shaft and the bearing, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

Re claim 50, the feature of the thermoplastic material comprising about 55% of aluminum oxide, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

9. **Claim 45** is allowed.

The feature of the insert substantially encapsulated in the body and positioned between the shaft and the bearing, in combination with the other limitations present, are neither disclosed nor taught by the prior art of record.

Response to Arguments

10. Applicant's arguments filed on January 13, 2003 have been fully considered but they are not persuasive.

Re claim 1, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this particular case **Yamano** discloses the spindle motor essentially as claimed. **Kuwert et al.** disclose a spindle motor having the hub including the permanent magnet. **Nakamura et al.** disclose the injection molded thermoplastic material having linear thermal expansion of $1.97 \times 10^{-5}/^{\circ}\text{C}$ or 1.09×10^{-5} in/in $^{\circ}\text{F}$ and thermal conductivity of 0.0040 to 0.0055 cal/s $^{\circ}\text{C}$ or 1.67 watts/m $^{\circ}\text{K}$. **Shioya et al.** disclose the insert used as back iron to enhance the magnetic effect.

In combination **Yamano**, **Kuwert et al.**, **Nakamura et al.** and **Shioya et al.** disclose the invention as claimed.

The newly added limitation of the injection molded resin member has not been given patentable weight since the method of forming the device is not germane to the issue of patentability of the device itself. Moreover, the injection molding of resins is well known in the art and is disclosed in the cited US Patent No 5,459,190 to Nakamura et al. (Re Abstract lines 6 and 7)

Applicant's argument regarding the **Shioya's et al.** disclosed insert positioning in the groove as a prove that the insert can not be encapsulated in the base is respectfully traversed by examiner. The cited reference states only that the insert is accommodated in the groove. The method of creating the groove and the way when and how the insert is accommodated in the groove is not addressed by the cited reference. Yamano, Kuwert et al. and Nakamura et al. teach the encapsulation of motor parts and the material suitable for such encapsulation..

Prior Art

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Waks whose telephone number is (703) 308-1676. The examiner can normally be reached on Monday through Thursday 8 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.


JOSEPH WAKS
PRIMARY PATENT EXAMINER
TC-2800

JW
April 2, 2003